

FACT SHEET FOR NPDES PERMIT WA-003057-1
Eastsound Sewer and Water District Wastewater Treatment Plant

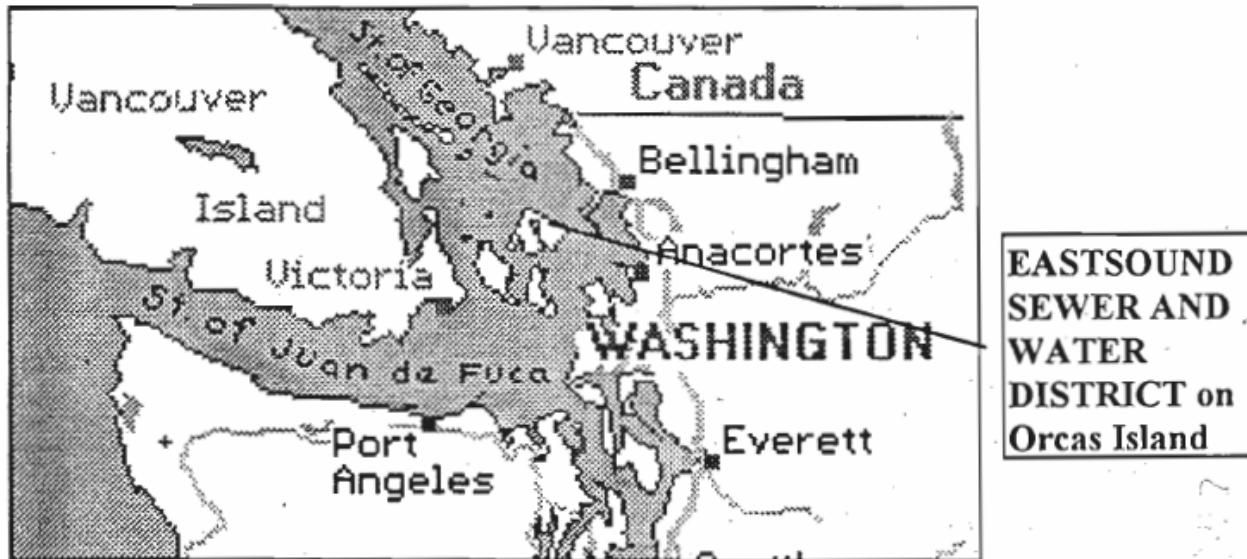


FIGURE 1: VICINITY MAP, NW WASHINGTON

This fact sheet is a companion document to the draft National Pollutant Discharge Elimination System (NPDES) Permit for the Eastsound Sewage Treatment Plant. The fact sheet explains the nature of the proposed discharge, the Department of Ecology's (the Department's) decision on limiting the pollutants in the waste water, and the regulatory and technical basis for those decisions. The fact sheet and draft permit are available for review (see Appendix A—Public Involvement for more detail on the public notice procedures). A glossary of terms used in the fact sheet and permit are included in Appendix B.

GENERAL INFORMATION	
Applicant	Eastsound Sewer and Water District
Facility Name and Address	Eastsound Sewage Treatment Plant P.O. Box 640 Eastsound, WA 98245
Type of Treatment	Activated Sludge – Extended Aeration – STEP System
Discharge Location	President Channel – Puget Sound Latitude: 48° 43' 15" N Longitude: 122° 54' 20" W
Waterbody ID Number	WA-02-0020

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES Permit Program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the Wastewater Discharge Permit Program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and Sediment Management Standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES Permit Program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty (30) days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit, and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—Response to Comments.

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The Eastsound WWTP serves a population of approximately 1,000 people. The sewage system for Eastsound consists of a pressure sewer collection system, an extended aeration treatment, secondary clarification, plant chlorine disinfection, and a marine outfall. Domestic sewage flows into property owners' septic tanks. Pumps move the sewage into positive pressure collection pipes, and the pipes carry the flows to the treatment plant. The District is responsible for servicing the system from the septic tank to the treatment plant.

HISTORY

Eastsound WWTP began operation in 1980. The Eastsound Sewer and Water District constructed the plant, collection system, and outfall to alleviate health hazards associated with failing septic system in the area. Individual septic tanks still provide primary treatment of the sewage at residences. The only commercial or industrial discharge to the system is from restaurants.

The plant is classified as Class 2. The plant is staffed by one full-time Class 3 operator, two Class I operators, and an assistant.. The operator is available on a call basis during nonbusiness hours.

Influent to the treatment plant is pre-aerated for odor control, biologically degraded in an extended aeration chamber, settled in a clarifier and disinfected with chlorine prior to discharge to President Channel. The plant was designed to provide chlorine contact-time in the outfall pipe instead of chlorine contact basin. Serpentine chlorine contact chamber was added. The process is diagrammed in Figure 2.

The operator removes waste biosolids from the treatment plant about twice a month. Sludge is stored and dewatered in a covered sludge drying bed or hauled in a raw state. Sludge from individual residence septic tanks is removed as needed. Sludge is removed from restaurant septic tanks quarterly. Waste activated sludge is removed from the plant by Dra-maid dewatering bagger. Bagged WAS goes to the landfill. Septage from the individual tanks is hauled by Vac Tank Western Services to the Baird Springs facility in Quincy, WA.

This permit authorizes discharge to President Channel. President Channel is designated as Class AA estuarine marine water in the vicinity of the outfall.

TREATMENT PROCESSES

Treatment consists of primary in septic tanks followed by extended aeration package plants, secondary clarifiers, and chlorination. Excess biosolids are removed by Dramid Sludge Bag Dewatering system. Final sludge disposal is into landfill.

Individual pumps in the septic tanks pump effluent from the individual on-site septic systems. The waste water is collected in a network of pressure mains from two inches up to eight inches in diameter. At the treatment plant the flow is split by a tee and pinch valve flow control splitter so that about half of the inflow goes to each of two, extended aeration, 0.08 MGD package treatment plants operating in parallel. After aeration and settling, the flows recombine in serpentine chlorine contact chambers. After chlorination, the effluent flows through a V notch weir for flow measurement by a Steven flow recorder and then via a 10-inch discharge pipe to a marine diffuser in President Channel. Excess biosolids are dewatered in a dra-maid dewatering unit. Water from the dra-maid is returned to the plant inflow for further treatment. Solids are bagged by the machine for disposal. An automatic diesel powered generator will run the treatment plant in the event of power failure.

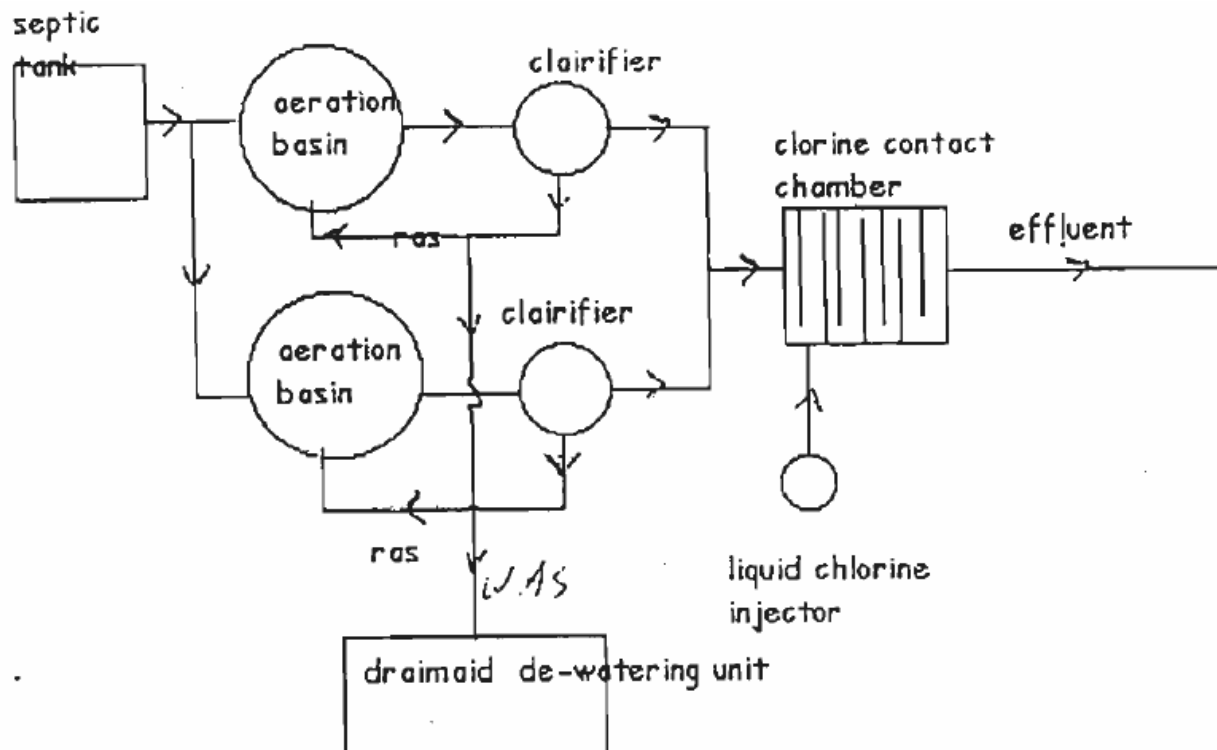


FIGURE 2: PROCESS CONTROL DIAGRAM FOR EASTSOUND WWTP

COLLECTION SYSTEM STATUS

The collection system for the Eastsound wastewater treatment plant is a S.T.E.P. (Septic Tank Effluent Pump) system. Waste from the building is collected in a tank from a 1000-gallon minimum to multiple tank system of 10,000 gallons or more. After retention in the septic tanks, the liquid passes through effluent filter (Orenco style) and is pumped by high head effluent pumps which discharge through 1¼-inch PVC lines through a check valve and into the collection lines. The collection system consists of approximately six miles of PVC pipe from two inches to eight inches. The septic tank pumps have sufficient head to pump to the treatment plant without lift stations.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility into President Channel. The existing outfall which discharges into President Channel of the Strait of Georgia is an 8-inch line which terminates with 3- to 4-foot diffuser approximately 1,000 feet from the shore and located on the north side of Orcas Island under 40 feet of water during mean lowered low water. The outfall has been upgraded with the addition of a 10-inch line parallel to the existing 8-inch line for the land portion. The diffuser for the outfall is 1,100 feet from the shore.

RESIDUAL SOLIDS

Residual solids generated at the plant include waste activated sludge. Sludge (bagged wasted sludge) is currently removed from the plant by district personnel to the County Transfer Station, then to the Columbia Ridge Landfill in Oregon.

The treatment facilities remove solids during the treatment of the waste water at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit and screenings are removed in the septic tanks. Solids removed from the clarifiers are treated (process used), bagged, and sent to solid waste.

PERMIT STATUS

The previous permit for this facility was issued on March 6, 2001. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform Bacteria, and Total Residual Chlorine.

An application for permit renewal was submitted to the Department on December 28, 2004, and accepted by the Department on March 4, 2005.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection in March of 2000. A Class II compliance inspection with sampling was conducted on March 28, 2000. Effluent samples were split to determine the compatibility of Ecology and East Sound Water District Wastewater Treatment Plant Laboratory results and sampling methods. All inspection reports are in the facility record file at the Northwest Regional Office of the Department.

During the history of the previous permit, the Permittee has had a number of violations, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. They include BOD₅, Inf. flows, TSS, and percent removal.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in Discharge Monitoring Reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

Parameters	Influent Design	Effluent Annual Average
BOD ₅	265.55	3.9
Total Suspended Solids, mg/L	73.39	3.8
Chlorine, Total Residual, mg/L	N/A	0.27
Temperature, Summer - Winter	N/A	22-13
Dissolved Oxygen (DO), mg/L	N/A	6.8

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC), or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances, the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility, taken from the Eastsound Sewer and Water District Engineering Report prepared by Wilson Engineering, are as follows:

Table 2: Design Standards for Eastsound Sewer Water District WWTP.

Parameter	Design Quantity
Monthly average flow (maximum month)	0.16 MGD
BOD ₅ influent loading	265.55 lb/day
TSS influent loading	73.39 lb/day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available and reasonable methods of prevention, control, and treatment for municipal waste water.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS, taken from Chapter 173-221 WAC, are:

Table 3: Technology-based Limits.

Parameter	Limit
pH	Shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed twenty percent (20%) of the average influent concentration Average Weekly Limit = 45 mg/L This type of treatment plant uses individual septic tanks for primary treatment. Some of the TSS loads are removed at the septic tanks, and some are removed at the extended air package plant. The percentage removed across the septic tanks is approximately 70 percent, but it is not possible to directly measure total removal efficiency across the treatment plant. Discharge Monitoring Reports over the past five years show that the Eastsound Wastewater Treatment Plant can consistently achieve greater than 80 percent TSS removal, in addition to removals in the septic tanks. The plant TSS removal is set at 80 percent.
Chlorine	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The existing permit has a chlorine limit of 0.5, and the facility is able to comply with it. The proposed permit includes the same limit.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lb/day) for BOD and TSS were calculated as the maximum monthly design flow (0.16 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 40.032 lb/day.

The weekly average effluent mass loading is calculated as $1.5 \times \text{monthly loading} = 1.5 \times 40 \text{ lb/day} = 60 \text{ ppd}$.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that Waste Discharge Permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other diseases and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water discharge condition with highest potential for adverse impact on the aquatic biota, human health and existing characteristic waterbody uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutant that can have toxic effects on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to President Channel which is designated as a Class AA receiving water in the vicinity of the outfall. Other nearby point source outfalls include Orcas Village STP and Friday Harbor Waste Treatment Plant. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	7 mg/L minimum
Temperature	13 degrees Celsius maximum or incremental increases above background
pH	7 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of list models, dye studies used. The dilution factors have been determined to be (from Appendix C):

	Acute	Chronic
Aquatic Life	150:1	250:1
Human Health, Carcinogen		250:1
Human Health, Non-carcinogen		250:1

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD₅—This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature—Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH—Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal Coliform—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 250:1.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and heavy metals, and a few pollutants from EPA's list of 126 priority pollutants. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for all detected priority pollutants and ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The parameters used in the critical condition modeling are as follows: acute dilution factor 150:1, chronic dilution factor 250:1.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the waste water in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity, and other WET tests measure chronic toxicity.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

HUMAN HEALTH

Washington's Water Quality Standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge does not contain chemical of concern based on existing data or knowledge. The discharge will be reevaluated for impacts to human health at the next permit issuance.

SEDIMENT QUALITY

The Department has promulgated Aquatic Sediment Standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED March 6, 2001

Parameter	Existing Limits Technology-based	Proposed Limits Technology-based	Final Permit Limits
BOD ₅	30, 45 mg/L 40, 60 lb/day	30, 45 mg/L 40, 60 lb/day	30, 45 mg/L 40, 60 lb/day
BOD % Removal	At least 85%	At least 85%	At least 85%
TSS	30, 45 mg/L 40, 60 lb/day	30, 45 mg/L 40, 60 lb/day	30, 45 mg/L 40, 60 lb/day
TSS % Removal	At least 85%	At least 80%	At least 80%
pH	6.0 - 9.0	6.0 - 9.0	6.0 - 9.0
Fecal Coliform	200/100mL 400/100 mL	200/100mL 400/100 mL	200/100 mL 400/100 mL
Residual Chlorine	0.5 mg/L, 0.75 mg/L	0.5 mg/L, 0.75 mg/L	0.5 mg/L, 0.75 mg/L

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for STEP and Extended Aeration (activated sludge).

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for: BOD₅, TSS, Residual Chlorine, and Fecal Coliform.

OTHER PERMIT CONDITIONS

REPORTING AND RECORD KEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit Requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the San Juan County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing Wastewater Discharge Permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The

requirements for a Pretreatment Program are contained in Title 40, Part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging waste water that is similar in character to domestic waste water are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State Water Quality Standards and Biosolids Standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a Wastewater Discharge Permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a Wastewater Discharge Permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State Waste Discharge Permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State Waste Discharge Permit application.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, storm water and other direct inflow sources, and waste waters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit Condition S.8 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
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1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations (<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

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1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on March 9 and March 16, 2005, in the *Island Sounder* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on June 14, 2006, in the *Island Sounder* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 425-694-7146, or by writing to the address listed above.

This permit and fact sheet were written by Bernard Jones.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART—An acronym for “all known, available and reasonable methods of prevention, control, and treatment.”

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in waste water. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect waste water.

Average Monthly Discharge Limitation—The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation—The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅—The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine—Chlorine is used to disinfect waste waters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity—The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)—The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Continuous Monitoring—Uninterrupted, unless otherwise noted in the permit.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the waste water. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated waste water and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User—A discharger of waste water to the sanitary sewer which is not sanitary waste water or is not equivalent to sanitary waste water in character.

Industrial Waste Water—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic waste water. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)—"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference—A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility—A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility—A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

Pass Through—A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State Water Quality Standards.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User—A potential significant industrial user is defined as an industrial user which does not meet the criteria for a significant industrial user, but which discharges waste water meeting one or more of the following criteria:

- a. Exceeds 0.5 percent of treatment plant design capacity criteria and discharges <25,000 gallons per day; or
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)—A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)—

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process waste water to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down waste water); contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Storm Water—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State Water Quality Standards can be found on the Department's homepage at (<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)

[illegible]

Acute Dilution Plumes Output

Acute dilution factor is 150:1 based on mid-range current speed shown above. Design flow of plant (which exceeds the highest daily flow of plant over the last three years) used for acute dilution model. The result of the model output was rounded from 143 to 150:1. Density data from June, 1992 produced the most critical conditions for the acute dilution zone.

```
Apr 11, 1995, 8:52: 3 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 12 of 23
Title acutenov92 flow, ave vel linear
tot flow * ports port flow spacing effl sal effl temp far inc far dis
0.001168 1 0.001168 2.743 0.0 20 7.315 73.15
port dep port dia plume dia total vel horiz vel vertl vel asp coeff print frq
11.89 0.1016 0.1016 0.1441 0.000 0.1441 0.10 500
port elev ver angle cont coef effl den poll conc decay Froude # Roberts F
0.3048 90 1.0 -1.73284 100 0 0.9912 1519
hor angle red space p amb den p current far dif far vel K:vel/cur Stratif #
90 2.743 19.4312 0.5124 0.00034 0.3658 0.2812 0.004212
depth current density salinity temp amb conc N (freq) red grav.
0.0 1.2 9 0.09187 0.2079
2 1.2 11 buoy flux puff-ther
4 1.2 14 0.00008853 0.06105
8 0.95 17 jet-plume jet-cross
12 0.5 19.5 0.09481 0.02532
0.001805 0.3758
plu-cross jet-strat
plu-strat
0.7481
hor dis>=
```

CORMIX1 flow category algorithm is turned off.

0.7481 m, 2.454 ft

to m range

Help: F1. Quit: <esc>. Configuration:ATNM1. FILE: ESOUND.VAR;

UM INITIAL DILUTION CALCULATION (linear mode)

```
plume dep plume dia poll conc dilution hor dis
m m m
11.89 0.1016 100.0 1.000 0.000
11.89 0.1050 95.93 1.042 4.858E-06 -> begin overlap
-> dilution overestimated (allowable error)
11.89 0.1073 42.93 2.302 0.0005594 -> end overlap
11.75 0.3037 3.125 31.36 1.832
11.44 0.7450 0.4843 202.3 10.15 -> trap level
11.32 1.005 0.2595 377.4 21.30
-> local maximum rise or fall
```

Notes: Plumes did not merge with 3 ports at the edge of the acute mixing zone. This trial uses 1/3 of the plant flow through one port of the diffuser. Dilution was interpolated as 143:1 at 7.1 meters (edge of acute dilution zone) and rounded off to 150:1.

Chronic Dilution Plumes Output

Chronic dilution factor is 242:1 rounded to 250:1 based on current speed of 0.4 feet per second (0.12 meter per second). Maximum monthly average flow over last three years (0.044 MGD) used for chronic dilution model.

```
Apr 11, 1995, 14: 4: 0 ERL-N PROGRAM PLUMES, Ed 3, 3/11/94 Case: 23 of 23
Title chronic june 92 low vel linear
tot flow # ports port flow spacing effl sal effl temp far inc far dis
0.001928 3 0.0006427 2.743 0.0 20 7.315 73.15
port dep port dia plume dia total vel horiz vel vertl vel asp coeff print frq
11.89 0.1016 0.1016 0.07927 0.000 0.07927 0.10 500
port elev ver angle cont coef effl den poll conc decay Froude # Roberts F
0.3048 90 1 -1.73284 100 0 0.5454 23.38
hor angle red space p amb den p current far dif far vel K:vel/cur Stratif #
90 2.743 19.4312 0.1044 0.0003 0.3658 0.7590 0.004212
depth current density salinity temp amb conc N (freq) red grav.
0.0 0.3 9 0.09187 0.2079
2 0.3 11 buoy flux puff-ther
4 0.3 14 0.00004871 0.05708
8 0.24 17 jet-plume jet-cross
12 0.1006 19.5 0.05217 0.06835
plu-cross jet-strat
0.1173 0.2787
plu-strat
0.6443
hor dis>=
```

CORMIX1 flow category algorithm is turned off.

0.10 0.0 to 0.5 range

Help: F1. Quit: <esc>. Configuration:ATNMO. FILE: ESOUND.VAR;

UM INITIAL DILUTION CALCULATION (linear mode)

```
plume dep plume dia poll conc dilution hor dis
m m
11.89 0.1016 100.0 1.000 0.000
11.89 0.1039 95.93 1.0420.00002361 -> begin overlap
-> dilution overestimated
11.89 0.1839 31.21 3.158 0.0008256 -> end overlap
11.59 0.4744 3.125 31.36 0.5769
11.21 0.9693 0.7090 138.2 2.168 -> trap level
11.03 1.258 0.4072 240.6 4.745
-> local maximum rise or fall
```

Plumes not merged, Brooks method may be invalid.

FARFIELD CALCULATION (based on Brooks, 1960, see guide)

Farfield dispersion based on wastefield width of 6.744m

```
--4/3 Power Law-- --Const Eddy Diff--
conc dilution conc dilution distance Time
m sec hrs
0.4060 241.3 0.4060 241.3 7.315 7.027 0.0
0.4066 240.9 0.4066 240.9 14.63 27.02 0.0
0.4069 240.8 0.4068 240.8 21.95 47.02 0.0
0.4070 240.7 0.4070 240.7 29.26 67.02 0.0
0.4070 240.7 0.4070 240.7 36.58 87.02 0.0
0.4070 240.7 0.4070 240.7 43.89 107.0 0.0
0.4068 240.9 0.4069 240.8 51.21 127.0 0.0
0.4062 241.2 0.4066 240.9 58.52 147.0 0.0
0.4053 241.7 0.4061 241.3 65.84 167.0 0.0
0.4040 242.5 0.4053 241.7 73.15 187.0 0.1
```

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AMMONIAfw.XLS

**AMMONIA WATER QUALITY
CRITERIA CALCULATION**

NPDES Permit #

Calculation Of Ammonia Concentration and Criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT

1. Ambient Temperature (deg C; 0<T<30)	15.0
2. Ambient pH (6.5<pH<9.0)	7.90
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

OUTPUT

1. Intermediate Calculations:	
Acute FT	1.41
Chronic FT	1.41
FPH	1.05
RATIO	14
pKa	9.56
Fraction Of Total Ammonia Present As Un-ionized	2.1289%
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	174.8
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	39.8
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	8.2
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	1.9
4. Total Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	6.7
Chronic Ammonia Criterion as N	1.54

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AMMONIAfw.XLS

AMMONIA WATER QUALITY CRITERIA CALCULATION

NPDES Permit #

Calculation Of Ammonia Concentration and Criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT

1. Ambient Temperature (deg C; 0<T<30)	23.0
2. Ambient pH (6.5<pH<9.0)	7.90
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

OUTPUT

1. Intermediate Calculations:	
Acute FT	1.00
Chronic FT	1.41
FPH	1.05
RATIO	14
pKa	9.31
Fraction Of Total Ammonia Present As Un-ionized	3.7726%
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	246.9
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	39.8
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	6.5
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	1.1
4. Total Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	5.4
Chronic Ammonia Criterion as N	0.87

APPENDIX D—RESPONSE TO COMMENTS

Comment:

I am writing this letter in protest of the increased testing requirements in the new draft NPDES permit. Our treatment plant history during the previous permit cycle is of compliance with the existing permit and consistent discharge quality far above the permit requirements. I don't feel it is necessary to increase testing requirements to seven days a week for pH and Total Chlorine, and twice a week for BOD, TSS and Fecal Coliform. This increase places an unnecessary burden on the present operations staff, and significantly increases the cost in labor and materials required to conform with the permit requirements without improving the quality of our discharge. This effort could be better utilized maintaining the plant and collection system.

The Eastsound Sewer and Water District currently has a total of four full time employees. Superintendent & Plant Operator Class III, Office Manager and Operator Class I, Maintenance Person and Operator Class I, and Treatment Plant and collection System Maintenance Person. Duties are shared between various staff members in order to get everything done. The two Maintenance persons share duties for treatment plant maintenance and collection system maintenance. The Collection System is a STEP system so requires extensive maintenance on a daily basis. The Superintendent, as well as performing the full time job of plant operator, administrator and lab technician, helps the maintenance personnel in the collection system whenever needed. The Office Manager as well as performing a full time office position, performs the duties of backup operator and Lab Technician whenever needed. The District is currently doing everything necessary in order to maintain a well run organization and ensure that all parameters of the existing NPDES permit are met. This has been proved by the District's record in past years. Compliance awards were received for years 1997, 1998, 1999, 2000 and 2002.

The District's budget is such that it barely covers expenses and frequently runs expenditures over revenues. The new requirement proposed by the Department of Ecology for 7 days a week testing of the treatment plant and twice a week lab tests for BOD, TSS and Fecal Coliform would be an untold financial burden on the District. We believe that this new requirement will place an unfair additional cost on the users of the sewer system.

Response:

Based on a design flow of 0.16 MGD for the Eastsound WWTP, the recommended minimum monitoring for POTW's discharging to surface water is outlined in Table X 111-1C of the *Permit Writer's Manual*. The manual recommends daily grab samples for pH and total residual chlorine. However, in view of the facts, the pH and total residual chlorine are relatively insignificant parameters, we will accept 5/week frequency for each.

Comment:

I am also protesting the 80% removal requirement for TSS. Primary treatment in the individual septic tanks removes a significant percentage of the total solids. This plant should not be penalized because the nature of a STEP system precludes measuring the true influent strength of the waste stream. With the precedent of South West region STEP systems exempted from the percent removal requirement I don't understand its inclusion in our current draft permit. The fact that previous performance indicates that this requirement can be achieved is predicated on the current plant influent of approximately half design capacity. It is unrealistic to assume that the treatment plant can continue to achieve this exceptional level of performance as loading increases.

Response:

The Eastsound WWTP has been operating under an 85 percent removal effluent limitation in the previous permit. The District requested elimination of 85 percent removal limitation. Chapter 173-221-050(4)a allows for a lowering of the percent removal effluent limitation. Based on the documentation submitted, the percent of removal effluent limitation will be 80 percent.